MT

COAL INDUSTRY STANDARD OF

THE PEOPLE'S REPUBLIC OF CHINA

MT/T 199-1996

Replacing MT 199-89

Mine hydraulic drilling - General technical conditions

煤矿用液压钻车通用技术条件

Issued on: April 18, 1996 **Implemented on: October 01, 1996**

Issued by: Ministry of Coal Industry of the People's Republic of China

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Mine hydraulic drilling - General technical conditions

1 Subject theme and application scope

This Standard specifies the technical requirements, test methods, inspection rules, marks, packaging, transport and storage for mine hydraulic drilling (including tunneling drilling, anchor bolt drilling and drill loader, hereinafter referred to as “drilling”).

This Standard is applicable to mine hydraulic drilling. Mine semi-hydraulic drilling as well as its components such as stand, boom and propeller shall also refer to this Standard for use.

2 Normative references

GB 3766, *Hydraulic fluid power - General rules and safety requirements for systems and their components*

GB 3836.1, *Explosive atmospheres - Part 1: Equipment - General requirements*

GB 3836.2, *Explosive atmospheres - Part 2: Equipment protection by flameproof enclosures “d”*

GB 3836.4, *Explosive atmospheres - Part 4: Equipment protection by intrinsic safe circuits and electrical apparatus “i”*

GB 5898, *Measurement of noise emitted by rock drilling machines and pneumatic tools - Engineering method*

GB 7935, *Hydraulic fluid power - General requirements for hydraulic components*

GB/T 13306, *Plate*

GB 13813, *Testing method and judging rule of safety to friction spark of metallic material for coal mine*

JB 2299, *Specification for copper-infiltrated tungsten for rocket nozzle*

JB/T 7302, *Rock drilling machines and pneumatic tools - General specifications for packing of products*

3.1.11 The drilling's dimensions (including profile dimensions in transport state and dimensions in working state), machine weight shall meet the design requirements.

3.2 Assembling requirements

3.2.1 Before assembling, all parts especially inner and outer grooves, holes, blind holes must be thoroughly cleaned to remove contaminants.

3.2.2 Anti-loose adhesive shall be applied to the fasteners at the junction of key elements and components. Tighten the fasteners according to the designed torque.

3.3 Hydraulic system working fluid and filtration precision requirements

3.3.1 According to the specific situation under the shaft, determine that the working liquid used is mineral oil or flame-retardant liquid. When mineral oil is used, the main performance indicators of the drilling shall not be less than the indicators for using N46 anti-wear hydraulic oil. When flame-retardant liquid is used, it shall perform the performance and reliability tests to the drilling.

3.3.2 The return oil filtration precision of hydraulic system is not less than 30 μm. The filtration precision of key components such as rock drill impact mechanism is not less than 10 μm.

3.3.3 The working liquid must be injected into the fuel tank through a filter of which the filtration precision is not less than 25 μm.

3.3.4 The working temperature inside the fuel tank must not be higher than 65°C.

3.4 Electrical performance

3.4.1 The starting current of the motor must not exceed the specified value.

3.4.2 The electrical elements are flexible and reliable. Electrical wirings such as control, power, lighting wirings are firm and in accordance with GB 3836.1.

3.5 Pressure resistance and sealing performance

3.5.1 It shall perform the pressure resistance test for the hydraulic system. Under the test pressure, the seals such as joint surface, pipe joint of pressure shell, hydraulic element are not allowed to have leakage, damage or other unusual phenomena.

3.5.2 When the hydraulic cylinder equipped with hydraulic lock is locked, under its rated load, the amount of movement of the piston rod shall not exceed 4.0 mm within 6 h.

4.6 Use dial indicator to measure the displacement of piston rod.

4.7 For trackless drilling, there shall be a flat test site of which the length is 50 m, the width is 5 m AND a test site of which the slope length is 15 m, the tilting angle meets drilling designed requirements. For track drilling, there shall be a test site of which the length and the width are same with the trackless drilling's, the slope of the track is not more than 7‰.

4.8 When measuring the drilling's walking speed on the test site, the walking distance shall not be less than 30 m. Use stopwatch to record time. Use steel tape to measure distance. Then calculate the average walking speed of three cycles.

4.9 On the test site, the boom, propeller and rock drill of drilling are drawn into the final position that is parallel to the machine's longitudinal centerline. Observe walking stability when it is starting, braking, turning, forwarding, backing and climbing. After the stable legs are put down to support on the ground, after each boom, propeller and rock drill are stretched to the most front end and swung to the extreme position at same side, observe the static stability of drilling. Under the maximum propulsion pressure, each propeller heads tightly to the rock surface or other fixture. Start the rock drill at the same time. Observe the dynamic stability of drilling.

4.10 Operate boom's movement. Use steel tape to measure its deviation range.

4.11 Under the rated parameters, use pressure gauge of which the precision is ±1.5% to measure the propulsion cylinder pressure. Determine the propulsion according to the result that is calibrated with the test system of tensile pressure sensor.

4.12 Use test bar to center first. Use dial indicator to test the concentricity deviation between bit shank of holder.

4.13 Use natural rock of which the compressive strength is 80~120 MPa for the rock excavation test. Measure the impact working pressure, working flow at the same time.

4.14 The ambient temperature is not greater than 35°C. The drilling runs for 30 min. The rock drill works for 15 min. Use thermometer, semiconductor thermometer to respectively measure the temperature of tank working fluid, the temperature of rock drill shell.

4.15 According to the design requirements for hydraulic system and water supply, gas supply systems, set up the working pressure of each pressure regulating point. Use pressure gauge of which the precision is ±1.5% to check the pressure of each circuit in hydraulic system. Use pressure gauge of which the precision is ±2% to check the pressure of each circuit in water supply, gas

14	Reliability	3.10	4.18	-	New product
15	Supply range of completeness	3.11	-	√	√

5.3 Type inspection shall be performed in one of the following situations:

a) trial model identification for new product or old product produced in transferred plant;

b) great changes in structure, material, technique after official production which may affect product performances;

c) periodic inspection every five years during official production;

d) production resumed after discontinued production of more than one year;

e) great difference between exit-factory inspection results and previous type inspection results;

f) required by user in ordering contract and used as product acceptance basis;

g) required by national quality supervision organization.

5.4 See table for product's exit-factory inspection and type inspection items.

5.5 Randomly extract one product from product's type inspection samples. When the test data of the sample that has passed the reliability assessment, are confirmed by product quality supervision and inspection agency, the life test can be exempted.

5.6 In the type inspection items listed in Table 1, if any item's performance in No. 4~14 fails, or two items in No. 1~3, No.15 fail, then this product shall be rejected.

5.7 The product's exit-factory inspection results shall be recorded and filed for future reference. The product's type inspection shall have inspection report.

6 Marks, packaging, transport, storage

6.1 Marks

6.1.1 The product plate shall be fixed on obvious part of each product. The plate shall comply with the provisions of GB/T 13306. The content shall include the following information:

a) manufacturer's name;

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